

The Use of Blockchain and Biometric Authentication in Smart Voting Systems

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Abstract. Building a more efficient and smart voting system, over the conventional voting Systems has always been a big challenge in recent years. Because it must ensure a lot of qualities like security, authenticity, privacy, integrity, and transparency of the system. Blockchain is a decentralized network that provides integrity, immutability, security to the database. It is a recorded linked-list that is cryptographically connected. There is no central authority to govern the data or control the data. It is governed by the whole network. If anyone wants to change any single data item, he would have to change the data of millions of other blocks in the network, which is technically not feasible. And biometric authentication is a security mechanism, that authenticates people by using their biological factors. Common types of biometric authentication are fingerprint scanners, facial recognition, voice identification, iris scanner, etc. A questionnaire-based survey was conducted to identify and analyze the current problems in traditional voting systems. A literature review has been conducted to identify, analyze how these technologies have been applied in existing Systems. The results indicate that blockchain has established a solid foundation for the security and integrity of the Systems, and has made the databases tamper-free and immutable. Apart from that, Biometric authentication has helped the developers to solve the issues regarding voter's verification procedure, and it has prevented the risks like misusing and duplicating votes. In future works, these technologies will be used to develop and implement a smart voting system as an alternative solution for the conventional paper ballot voting system in Sri Lanka.

Keywords: *Blockchain, Biometric Authentication, Voters, Voting system.*